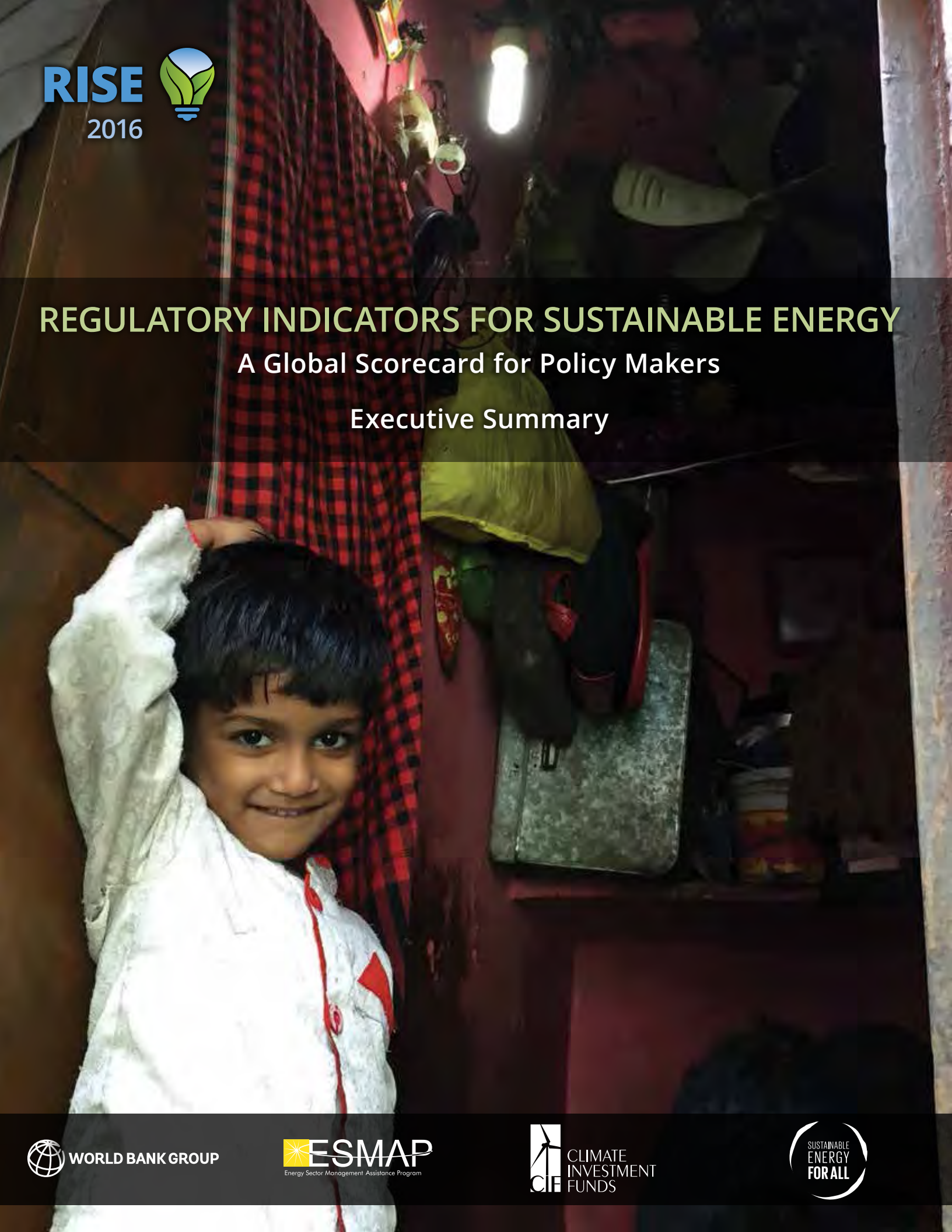
RISE 2016

REGULATORY INDICATORS FOR SUSTAINABLE ENERGY

A Global Scorecard for Policy Makers

Executive Summary



WORLD BANK GROUP

ESMAP
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CLIMATE INVESTMENT FUNDS

SUSTAINABLE ENERGY FOR ALL

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EXECUTIVE SUMMARY

Energy is at the forefront of the development agenda. Recognizing energy's vital role in development and prosperity, the world has committed to Sustainable Development Goal 7 to "Ensure access to affordable, reliable, sustainable and modern energy for all" as one of 17 goals for 2030, as well as to dramatically increase energy efficiency and the use of renewable energy. The historic climate change agreement in Paris in 2015 also draws attention to the essential scale-up of clean energy to attain a 2°C world, with energy featuring prominently in many countries' Nationally Determined Contributions.

Achieving these global energy goals calls for more than a trillion dollars of investment annually.[1] Reaching the 2030 targets set by Sustainable Energy for All (SEforALL)—universal access to electricity and clean cooking fuels, doubling the rate of improvement of energy efficiency, and doubling the share of renewable energy—requires an unprecedented scale-up of both public and private finance. Investment in sustainable energy is affected by many factors, including market size, country risk, and financial markets, to name but a few. But a country's policies and regulations also matter, and they are directly under the control of government. This report—based on a new and comprehensive global policy scorecard called Regulatory Indicators for Sustainable Energy (RISE) (box 1)—answers two important questions. Are policymakers around the world truly rising to the challenge posed by the new global sustainable energy agenda? Where is further action most critically needed?

WHAT IS RISE?

RISE is a set of indicators to help compare national policy and regulatory frameworks for sustainable energy. RISE assesses countries' policy and regulatory support for each of the three pillars of sustainable energy—access to modern energy, energy efficiency, and renewable energy. With 27 indicators covering 111 countries and representing 96 percent of the world population—RISE provides a reference point to help policymakers benchmark their sector policy and regulatory framework

Box 1 Regulatory Indicators for Sustainable Energy

- RISE, a product of the Sustainable Energy for All initiative's Knowledge Hub, aligns with the targets of Sustainable Development Goal 7 and SEforALL
- RISE provides information on how a country's regulatory environment compares with its peers and identifies priorities for improvement going forward.
- RISE reports on 27 indicators and 80 subindicators to capture the quality of policies and regulations for energy access, renewable energy and energy efficiency (see the box figure).
- RISE covers 111 countries across the developed and developing world, which together account for more than 90 percent of global population and energy consumption.
- RISE classifies countries into a green zone of strong performers in the top third, a yellow zone of middling performers, and a red zone of weak performers in the bottom third.
- RISE is underpinned by a vast public information base of primary policy and regulatory documents available to users at rise.worldbank.org.
- RISE indicators will be published bienially, with the next report due in 2018.

BOX FIGURE: Capturing the quality of the policy environment

	Policies and Regulations			Administrative Procedures*
Energy Access	• Existence and monitoring of officially approved electrification plan • Scope of officially approved electrification plan	• Framework for grid electrification • Framework for minigrids • Framework for stand-alone systems	• Consumer affordability of electricity • Utility transparency and monitoring • Utility creditworthiness	• Establishing a new household grid connection • Permitting a new minigrid
Energy Efficiency	• National energy efficiency planning • Energy efficiency entities • Information provided to electricity consumers • Incentives from electricity rate structures	• Mandates & incentives: large consumers • Mandates & incentives: public sector • Mandates & incentives: utilities • Financing mechanisms for energy efficiency	• Minimum energy performance standards • Energy labeling systems • Building energy codes • Carbon pricing and monitoring	• Securing energy efficiency appliance standards certification
Renewable Energy	• Legal framework for renewable energy • Planning for renewable energy expansion	• Incentives & regulatory support for renewable energy • Attributes of financial and regulatory incentives	• Network connection and access • Counterparty risk • Carbon pricing and monitoring	• Permitting a new renewable energy project

Source: RISE team.
*Not scored

against those of regional and global peers, and a powerful tool to help develop policies and regulations that advance sustainable energy goals. Each indicator targets an element of the policy or regulatory regime important to mobilizing investment, such as establishing planning processes and institutions, introducing dedicated incentives or support programs, and ensuring financially sound utilities. Together, they provide a comprehensive picture of the strength and breadth of government support for sustainable energy and the actions they have taken to turn that support into reality.

QUESTION 1: ARE POLICYMAKERS RISING TO THE CHALLENGE?

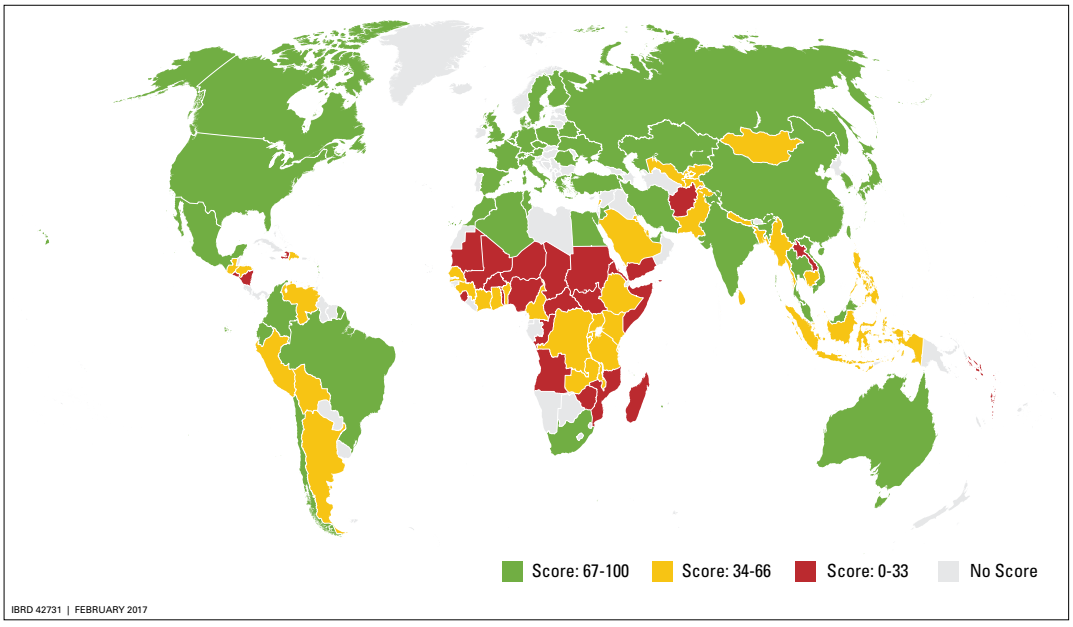
Across the globe, countries are embracing the sustainable energy policy agenda. Almost 80 percent of the 111 countries scored by RISE have begun to implement elements of supportive policy frameworks, and over a third—some 45 in all—are already at a reasonably advanced stage. Unsurprisingly, high-income OECD countries, long engaged on this agenda, tend to have stronger policy and regulatory frameworks, although there are some exceptions. The 24 countries making limited or negligible progress toward supporting sustainable energy development present a call for action to the international community (figure 1).

Numerous countries are emerging as sustainable energy leaders across the developing world. About half of the 45 countries with strong policy environments across all three pillars of sustainable energy are emerging economies, with examples in all regions and every peer group. They can be found in Africa (South Africa), Asia (China, India, Malaysia, Thailand, Vietnam), Europe and Central Asia (Armenia, Belarus, Kazakhstan, Russia, Turkey, Ukraine, Uzbekistan), Latin America (Brazil, Chile, Colombia, Mexico), and the Middle East (Algeria, Egypt, Iran, Jordan, Morocco, Tunisia) (figure 2).

Larger economies—with the greatest impact on global targets—tend to be among the top performers in putting in place a robust policy framework. Achieving the global targets for sustainable energy rests disproportionately on a fairly small group of countries with the largest populations and economies. The good news is that many of these highest impact countries have a supportive policy agenda. Of the world's ten largest energy consumers, seven score in the top tier of RISE countries for renewable energy, offering strong policy frameworks. Of the top ten energy suppliers, eight provide a similar high level of support for energy efficiency. But of the world's ten countries with the largest number of people without electricity, only five provide widespread policy support for energy access (figure 3).

The basics of renewable energy policy frameworks have been very widely adopted. The spread of renewable energy regulations has been remarkable. Almost all countries surveyed have a renewable energy target, and about three-quarters of them have adopted legislation and strategic plans and assigned responsible institutions to achieve those targets. There is also a very strong consensus that the private sector should participate in renewable energy development, now allowed in more than 90 percent of countries.

FIGURE 1 RISE overall scores



Source: RISE database and *Doing Business*, World Bank.

FIGURE 2 Most of the top RISE performers in each region have high scores (green dots)

	Developing world						High income OECD
	East Asia & Pacific	Europe and Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa	
Energy access[a]	Philippines ● Cambodia ● Indonesia ●	*Not applicable*	Guatemala ● Nicaragua ● Peru ●	*Not applicable*	India ● Bangladesh ● Sri Lanka ●	Kenya ● Uganda ● Tanzania ●	*Not applicable*
Renewable energy	China ● Malaysia ● Philippines ●	Kazakhstan ● Romania ● Turkey ●	Mexico ● Brazil ● Dominican Republic ●	Jordan ● UAE ● Egypt ●	Pakistan ● India ● Sri Lanka ●	South Africa ● Malawi ● Kenya ●	Denmark ● Netherlands ● Germany ●
Energy efficiency	Vietnam ● China ● Thailand ●	Romania ● Russian Federation ● Turkey ●	Mexico ● Ecuador ● Colombia ●	Tunisia ● Iran, Islamic Rep. ● UAE ●	India ● Sri Lanka ● Pakistan ●	South Africa ● Kenya ● Ghana ●	United States ● Denmark ● Canada ●

Source: RISE database, World Bank.
a. Does not include countries whose energy access policies were not assessed because of high electrification rates.

FIGURE 3 Most of the highest-impact countries for energy efficiency and renewable energy perform well in RISE (green dots); but for energy access, many see scores in the middle or lower ranges (yellow and red dots, respectively)

Top 10 countries with highest electricity access deficit	Energy access	Top 10 countries with highest primary energy demand	Renewable energy	Top 10 countries with highest primary energy supply	Energy efficiency
India	●	China	●	China	●
Nigeria	●	United States	●	United States	●
Ethiopia	●	Russian Federation	●	Russian Federation	●
Bangladesh	●	India	●	India	●
Congo, Dem. Rep.	●	Japan	●	Japan	●
Tanzania	●	Canada	●	Germany	●
Kenya	●	Germany	●	Brazil	●
Uganda	●	Brazil	●	Korea, Rep.	●
Sudan	●	Indonesia	●	Canada	●
Myanmar	●	Iran, Islamic Rep.	●	France	●

Source: RISE database, World Bank.

QUESTION 2: WHERE IS FURTHER ACTION MOST CRITICALLY NEEDED?

While progress is encouraging, there remain significant gaps in policy and regulatory frameworks. The RISE scorecard helps to pinpoint the places and issues where policies are lagging (box 1).

Sub-Saharan Africa—the least electrified continent and home to about 600 million people without electricity—has one of the least developed policy environments to support energy access. Of particular concern are Ethiopia, Nigeria, and Sudan—three of the most populous energy deficit countries, with a total unserved population of 116 million people. And as many as 70 percent of Africa's least electrified nations—each with access rates below 20 percent of the population—have barely begun to establish an enabling environment for energy access. Even so, some good performers have strong policy frameworks in place, such as Kenya, Uganda, and Tanzania. In contrast, countries in South Asia—specifically India and Bangladesh—are emerging as leaders in the access agenda with an innovative mix of grid and off-grid solutions. Sub-Saharan Africa trails South Asia in all RISE energy access indicators except the adoption of an officially approved electrification plan (figure 4).

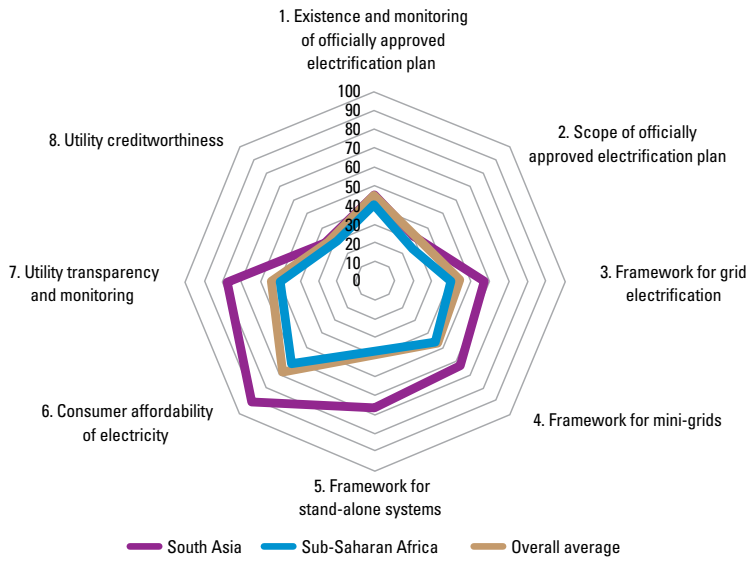
Policy frameworks for grid densification and expansion, the mainstay of electrification efforts, lag substantially behind and still need much progress. As many as 60 percent of access deficit countries score in the lowest tier for grid-based electrification (figure 5). Widespread problems are lack of capital subsidies to fund high up-front costs of household connection or expansion into rural areas, as well as lack of performance standards for new connections.

By neglecting enabling policies for stand-alone solar home systems, too many countries are missing out on the solar revolution's access dividend. Grid extension has been the mainstay of almost all countries that have already achieved universal electrification today. But technological change and the rapidly declining costs of solar PV now offer the possibility of complementing grid expansion with decentralized off-grid solutions, potentially accelerating the pace of electrification, particularly in remote areas. While countries —such as Madagascar, Nicaragua, the Philippines and Tanzania—score relatively well on the policy framework for minigrids; overall, there has been less enthusiasm for policy measures to facilitate uptake of stand-alone solar home systems. A few notable exceptions are Cambodia, Ghana, Kenya, and Uganda. In fact, the top RISE scorers in energy access do well across all three possible energy supply solutions—grids, minigrids, and stand-alone systems—suggesting they are being pursued not as substitutes but as complements.

Reaching universal access is more likely to be constrained by financially unviable utilities—limiting investments in grid expansion—than prices that are too high to be affordable. RISE finds that the affordability of electricity is not as significant a barrier to energy access as some might think. In part due to effective "lifeline" tariffs for those who consume the least amount of electricity, even the poorest 20 percent of households in the vast majority of countries can meet basic energy needs—for lighting, phone charging, and radio—with less than 5 percent of the family budget (figure 6). A bigger problem for access expansion may be that utilities are not collecting enough revenue in order to expand the distribution grid and offer electricity to new customers. In over three-quarters of countries, the utility is not a creditworthy entity, and most likely unable to fund new investments from its own balance sheet. Balancing affordability and financial viability requires policymakers to set tariffs (or allow them to be set) high enough that a utility's total revenue base—across all its consumers—allows for full cost-recovery, while ensuring that low-income customers are not asked to pay more than they can bear. Such a balance should be possible in many countries, although some small-island (Solomon Islands), fragile (Liberia), and landlocked (Burkina Faso) states face such high costs of electricity—often above US$0.30 per kilowatt-hour—that affordability and cost recovery may prove very difficult to reconcile.

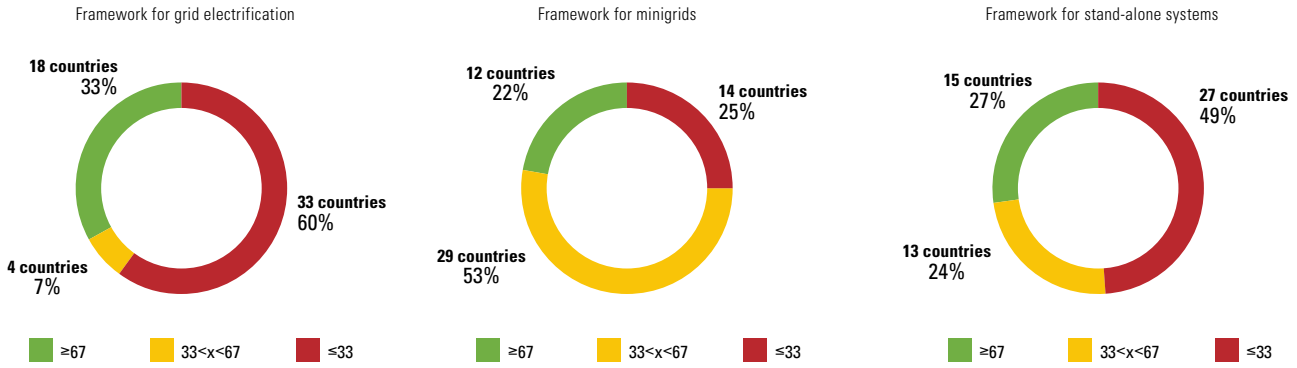
With the expansion of renewable energy, the practicalities of integrating wind and solar power into the grid become more important. As renewable energy costs fall and the share of renewable energy in power systems rises, understanding and planning for the integration of variable renewable

FIGURE 4 South Asian countries score higher on nearly all aspects of energy access policies than their counterparts in Sub-Saharan Africa



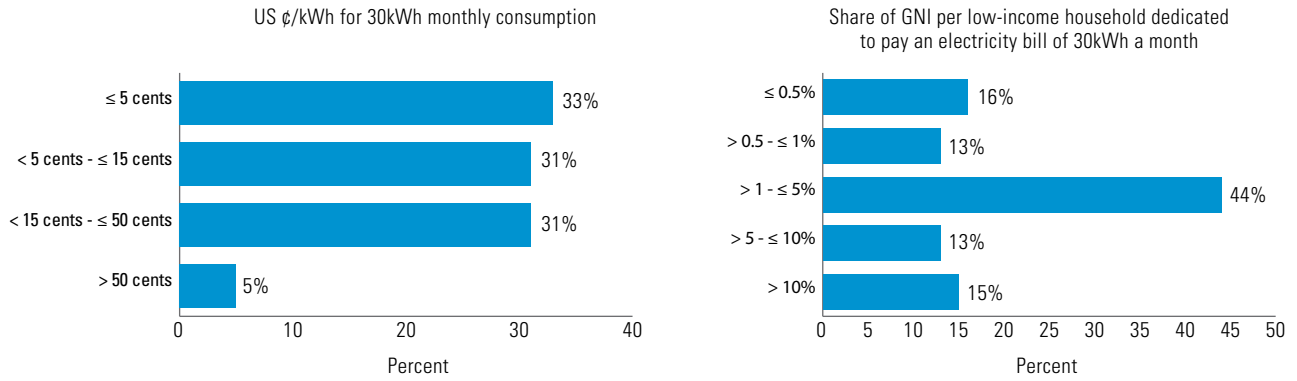
Source: RISE database and *Doing Business*, World Bank.

FIGURE 5 Many RISE countries see low scores for support to grid electrification and stand-alone systems. The number of countries with high scores are in green, medium in yellow, and low in red



Source: RISE database, World Bank.

FIGURE 6 Retail electricity tariffs usually are less than 15 cents per kilowatt-hour (left) and electricity typically takes up less than 5 percent of the lowest-income families' budgets (right)



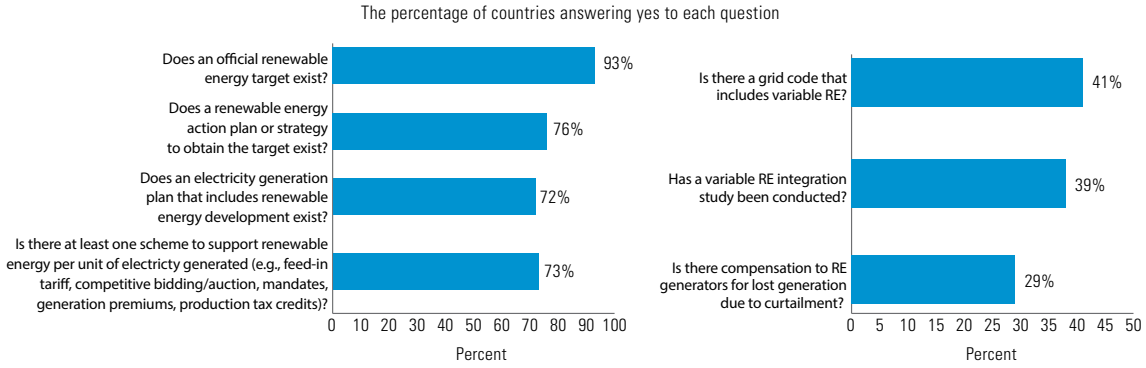
Source: RISE database, World Bank.

energy becomes essential (figure 7). Most countries have not yet conducted studies to understand the implications of bringing variable renewable energy into the grid, nor do they have technical codes in place that specify how renewable energy generators can connect to the grid. Elements such as these that are critical to the scale-up of renewables are far more likely to be in place in countries with significant shares of variable renewable energy already in the system. Of countries where wind and solar power account for at least 5 percent of total electricity generated in 2014, more than 80 percent have completed an integration study.

Energy efficiency is too often overlooked in the policy agenda. Although countries that pursue renewable energy policies are more likely to also pursue energy efficiency policies, the former seems to lag the latter systematically across a wide range of countries. The average score for efficiency is more than ten points below that for renewables, and far more countries have few or no policies in place to support it (figure 8). Given that energy efficiency measures are among the most cost-effective means of reducing a country's carbon footprint, this is another missed opportunity.

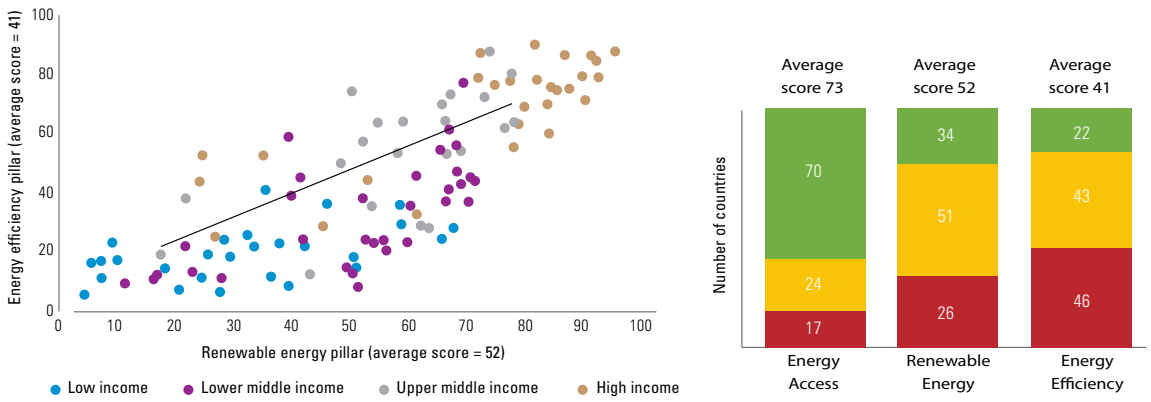
Many countries that have engaged on the energy efficiency agenda tend to do so at a relatively superficial level. Around the world, many of the basic elements of a regulatory framework for energy efficiency remain to be developed. Barely a third of countries have made serious progress in labeling energy-efficient appliances—or establishing building energy codes for construction or minimum energy performance standards for industry.

FIGURE 7 Most countries have renewable energy targets, plans and incentives; far fewer have grid codes that address RE or renewable energy integration studies



Source: RISE database, World Bank.

FIGURE 8 High renewable energy and energy efficiency scores are often found together (left), but far more countries have limited or no policy support for efficiency than the other two pillars (right)

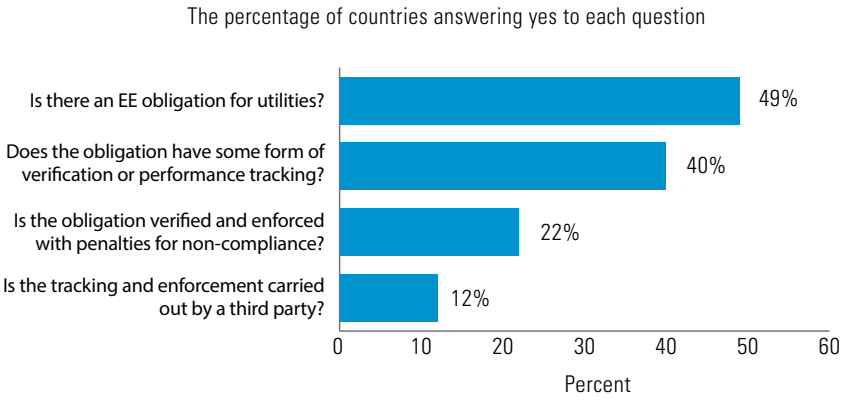


Source: RISE database, World Bank.

Critical aspects of energy efficiency, including the role of utilities, remain in their infancy. Utilities are one of the major actors in the power sector, but given their commercial incentive to sell power they are not always naturally aligned with the energy efficiency agenda. This tension can be overcome by altering the regulatory incentives under which utilities operate. Although the utilities face conflicts of interest with their commercial incentive to sell power and accrue more revenues, these can be corrected through suitable regulatory measures. Yet only half of countries require their utilities to undertake energy efficiency measures (figure 9).

However sound the sustainable energy policy framework, progress may remain slow without efficient administrative procedures. Critical to the enabling environment are both the policies on the books and the effectiveness of their implementation. It really matters how much consumers pay and how long they wait for a grid connection, or how long it takes a developer to get all the permits to start-up a minigrid, establish a wind farm, or certify an energy efficient appliance. The full cost of connecting to the grid, which varies from US$22 in Bangladesh to US$500 in several African countries, exceeds US$100 in the vast majority of countries—well beyond the means of a family living below the poverty line (on less than US$1.90 a day). Obtaining permits to expand energy access through a minigrid can take between 2 months (Madagascar) and 52 months (Sri Lanka), with an average lapse of 14 months. Setting up a grid-connected renewable energy project, such as a wind farm, takes 17 months on average, but again ranges between 1 month (Ukraine) and 60 months (Honduras). So to get the full benefit of good policies enacted, it is necessary to improve the administrative procedures that go with them.

FIGURE 9 Utilities have at least some form of energy efficiency obligation in half of RISE countries, but tracking or compliance mechanisms are often not in place



Source: RISE database, World Bank.

LOOKING FORWARD

This first global edition of RISE provides a snapshot in time, with all scores and information as of the end of 2015. Encouragingly, many of the countries with the greatest impact on global sustainable energy outcomes are developing, or have developed, strong policies and regulations. Yet policy frameworks on energy access are seriously lagging behind, especially in populous countries of Sub-Saharan Africa and those with particularly low electrification rates. Accelerating performance on access will require setting tariffs high enough to allow for new investments to expand the distribution grid while making sure the poorest populations can afford basic service, as well as improving the policy environment both for grid and off-grid technologies. Although progress on renewable energy and energy efficiency go together, the latter lags systematically behind. And while many countries have taken basic policy support measures for clean energy, these are still lacking in depth. For example, renewable energy policies need to give greater attention to the pressing issue of grid integration of variable renewable energy.

This is just the beginning. New, fully updated editions will be published biennially, with the next scheduled for 2018. It is expected that the value of RISE and the quality of underlying data will increase over time, as the indicators have been designed to allow for comparability not only across regions but year-on-year, and future editions will be able to consider the evolution of sustainable energy policies and, eventually, evaluate the effectiveness of different types of government support to the sector. At the same time, RISE is also intended to be flexible: appropriate policy approaches in any sector will evolve as technologies mature and new challenges arise, and the RISE indicators will be re-evaluated and updated as needed in each subsequent edition.

NOTES

1. 2015 Global Tracking Framework, the World Bank.

Many countries share the vision of a secure energy future for all people. For most countries, realizing this vision requires huge investment in sustainable energy and a solid enabling environment of policies, regulations, and institutions. The regulatory indicators for sustainable energy (RISE) is a tool to help countries get to where they want to be. The suite of indicators capture the policy and regulatory landscape in energy access, renewable energy, and energy efficiency and provide a global reference point for policymakers. RISE highlights good practices across countries, supports peer learning, and fosters enabling environment for sustainable energy.

RISE report, customized analyses, datasets, and library of legal and regulatory documents are available in:

http://RISE.worldbank.org//